**Claims:**

1. A process for producing a composite comprising a lignocellulosic fibrous matrix, having phenolic groups, and a hydrophobic polymer, said process comprising the steps of

a) oxidizing the phenolic groups or the groups having a similar structure to provide an oxidized fibre material,

b) contacting the oxidized fibre material with a modifying agent containing at least one first functional portion, which is compatible with the oxidized fibre material, and at least one second hydrophobic portion, which is compatible with the hydrophobic polymer, to provide a lignocellulosic fibre material having a modified surface, and

c) contacting the fibre material with the hydrophobic polymer under conditions allowing for intimate contacting between the modified fibre and the polymer to form a composite.

2. The process according to claim 1, wherein the lignocellulosic fibrous matrix is reacted with an oxidizing agent in the presence of a substance capable of catalyzing the oxidation of phenolic groups by said oxidizing agent.

3. The process according to claim 1 or 2, wherein the modifying agent is activated with an oxidizing agent.

4. The process according to any of claims 1 to 3, wherein the reaction of step (a) is carried out in aqueous phase at a consistency of about 0.1 to 95 % by weight of the fibre material.

5. The process according to any of claims 1 to 4, wherein the modifying agent comprises a hydrocarbon chain, which is compatible with the hydrophobic polymer.

6. The process according to any of claims 1 to 5, wherein the second portion of the modifying agent comprises an aliphatic, saturated or unsaturated, linear or branched hydrocarbon chain having at least 1 carbon atom, preferably 2 to 24 carbon atoms.

7. The process according to any of claims 1 to 6, wherein the first functional group is selected from the group of hydroxy, carboxy, anhydride, aldehyde, ketone, amine, amide, imine, imidine and derivatives and salts thereof.

8. The process according to any of claims 1 to 7, wherein the modifying agent comprises a plurality of first functional groups.

9. The process according to any of claims 7 or 8, wherein the modifying agent comprises at least one phenolic group.

10. The process according to any of the preceding claims, wherein the modifying agent comprises at least one compound selected from eugenol, isoeugenol and their alkyl derivatives, and alkyl derivatives of gallate.

11. The process according to any of the preceding claims, wherein the modifying agent is added in the form of a dispersion or as such.

12. The process according to claim 1, wherein the substance capable of catalyzing the oxidation of phenolic groups by said oxidizing agent is an enzyme.

13. The process according to any of the preceding claims, wherein the modifying agent is reacted with an oxidizing agent in the presence of an enzyme capable of catalyzing the oxidation of the phenolic groups.

14. The process according to claim 10, wherein the lignocellulosic fibre material and the modifying agent are mixed together in water to form an aqueous slurry having a consistency of 0.1 weight-% or more, and the oxidizing agent and the enzyme are added to the slurry.

15. The process according to any of the preceding claims, wherein the enzyme capable of catalyzing the oxidation of phenolic groups is selected from the group of peroxidases and oxidases.

16. The process according to claim 15, wherein the enzyme is selected the group of laccases (EC 1.10.3.2), catechol oxidases (EC 1.10.3.1), tyrosinases (EC 1.14.18.1), bilirubin oxidases (EC 1.3.3.5), horseradish peroxidase, manganase peroxidase (EC 1.11.1.13), lignin peroxidase (EC 1.11.1.14).

17. The process according to claim 15 or 16, wherein the enzyme dosage is 1 to 100,000 nkat/g, preferably 10-500 nkat/g, and it is employed in an amount of 0.0001 to 10 mg protein/g of dry matter.

18. The process according to any of the preceding claims, wherein the oxidizing agent is selected from the group of oxygen and oxygen-containing gases, such as air, and hydrogen peroxide.

19. The process according to claim 18, wherein oxygen or oxygen-containing gas is actively introduced into the aqueous slurry during the reaction.

20. The process according to claim 2, wherein the substance capable of catalyzing the oxidation of phenolic groups is hydrogen peroxide, Fenton reagent, organic peroxidase, potassium permanganate, ozone and chlorine dioxide, persulphate or an inorganic transition metal salt.

21. The process according to claim 1, wherein radical forming radiation capable of catalyzing the oxidation of phenolic or similar structural groups is used to provide an oxidized fibre material.

22. The process according to any of the preceding claims, wherein the reaction steps are carried out sequentially or simultaneously.